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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,010	08/27/2003	Attila Kovacs	NEC0255US	6058
33031	7590	11/22/2005	EXAMINER	
CAMPBELL STEPHENSON ASCOLESE, LLP 4807 SPICEWOOD SPRINGS RD. BLDG. 4, SUITE 201 AUSTIN, TX 78759			DINH, PAUL	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,010	KOVACS ET AL.	
	Examiner	Art Unit	
	Paul Dinh	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 18-31, 33-46 and 48-53 is/are rejected.
- 7) ☒ Claim(s) 17, 32 and 47 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Paul Dinh

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This FINAL OFFICE action is a response to the amendments + remarks filed on 11/7/05.

Claims 1-53 are pending.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

In claims 17, 32, and 47, the limitation “wherein a driver for driving signals on the new wire has substantially a same size as a driver for driving signal on the one of the one or more wires removed by said removing” finds no clear support in the specification.

Clarification is required.

Claim Objections

Claims 1, 21, 34, and 49 are objected to because an application/intended use/purpose should be recited in the preambles of these claims.

Claims 16, 31, 46 are objected to because, the limitation “the new (longer) wire has less delay than the wire removed” is a contradicting limitation as to how a longer wire has less delay than a removed (shorter) wire.

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-16, 18-21, 23-31, 33-34, 26-46, 48-51 and 53 are rejected under 35

U.S.C. 102(b) as being anticipated by Mellen et al (USP 6058256)

(Claim 1 and similarly recited claims 21, 34, 49, and 51)

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Detecting a timing violation, caused by crosstalk, in a timing path included in an IC design (fig 1-4);

Removing one of one or more wires included in the timing path, wherein the one of the one or more wires couples two nodes included in the IC design; and routing a new wire between the two nodes, wherein the new wire is longer than the removed one of the one or more wires, and the new wire experiences fewer crosstalk effects than the removed one of the one or more wires.

(Fig 4 and corresponding text shows the new wires (top wires in wire pairs 403, 405, and 407) are longer after wires are removed, shoving-aside and re-routed, re-designed, reconfigured, and route (terms used by Mellen) to reduce the crosstalk level (see fig 1, 3). Further evidences of teachings are at the following locations in Mellen, i.e., see one or more of the followings:

*Abstract; and
Fig 1 and particularly element 119 in fig 1 and fig 3 (redesign/reroute interconnections to reduce crosstalk); and
Col 2 lines 10-13, 64-66, and
Col 5 line 42 to col 6 line 67; and
Col 9 lines 13-24)*

(Claims 3-6, 23-26, 36-39, 50, 53) further comprising: calculating timing information for the one or more wires included in the timing path (fig 1, 3); and selecting the one of the one or more wires for removal dependent on the timing information wherein the timing information includes delay information (fig 1-6); further comprising selecting the one of the one or more wires for removal in response to the delay information indicating that the one of the one or more wires has a greater delay than other ones of the one or more wires included in the timing path (fig 1-6); further comprising: selecting the one of the one or more wires to remove in response to the delay information indicating that a delay of the one of the one or more wires exceeds a threshold delay (fig 1).

(Claims 7-10, 27-28, 40-41) the timing information includes slew information and delay information for each of the one or more wires included in the timing path (fig 2-7); further sorting the one or more wires included in the timing path based on the slew information and the delay information (fig 1, 3); dependent on an outcome of said sorting, selecting the one of the

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one or more wires for removal (fig 1-7); further comprising: sorting the one or more wires dependent on the timing information; and selecting the one of the one or more wires for removal in response to said sorting (fig 1-7).

(Claims 11-12, 42-43) wherein said removing is dependent on a location of the one of the one or more wires relative to one or more other wires included in the IC design (fig 3-7); further comprising: selecting the one of the one or more wires for removal in response to determining that the one or more wires has fewer neighboring wires than a second one of the one or more wires (fig 2-7)

(Claim 13) Wherein said detecting is performed by a sign-off tool (see checking/ verification/simulation tool in col 3, 7, fig 1, 3).

(Claims 14, 29, 44) further comprising: removing more than one of the one or more wires included in the timing path (fig 2-7), wherein each of the more than one of the one or more wires couples a respective pair of a plurality of pairs of nodes; and routing a new wire between each pair included in the plurality of pairs of nodes (fig 2-3, 5, 7).

(Claims 15, 30, 45) wherein said routing comprises routing the new wire so that a space exists between the new wire and any other wires (fig 3-7), wherein a size of the space is selected to reduce crosstalk effects between the new wires and one or more other wires (fig 1, 3-7).

(Claims 16, 31, 46) wherein the new wire has less delay and less slew than the one of the one or more wires removed by said removing (due to the crosstalk effect of the wires in this prior art being controlled/reduced, insofar the limitation is understood).

(Claims 18, 33, 48) wherein said routing does not introduce any new timing violations into the IC design (fig 1, 3)

(Claims 19-20) further comprising: performing said detecting, said removing, and said routing for a plurality of additional timing paths, wherein no new buffers are added, no existing drivers are resized, and no existing buffers are resized or moved in response to detection of the timing violations in the timing path (this prior art does not disclose: new buffers are added, existing drivers are resized, existing buffers are resized or moved); and subsequent to said performing, no timing violations are detected in a circuit design that includes the timing path and the plurality of additional timing paths (fig 1, 3); wherein a single wire is selected as the one of

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the one or more wires to be removed for more than one timing path of the plurality of additional timing paths (fig 2-5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a), which forms the basis for all obviousness rejections, set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 22, 35, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mellen et al (USP 6058256) in view of one or more of the prior art of record Beyne et al (US patent application Publication No. 2003/0060034) and Muddu et al (USP 6353917)

Mellen discloses substantially all the elements in claims 2, 22, 35, and 52 except routing a wire through a higher routing layer as claimed.

Beyne discloses routing a wire through a higher routing layer in paragraphs 0070.

Muddu discloses routing a wire through a higher routing layer in col 12 lines 58-62

It would have been obvious to one of ordinary skill in the art at the time of the invention to route a wire through a higher routing layer because routing a wire through a higher routing layer can avoid crosstalk (Beyne, paragraphs 0070) and/or due to the fact that critical signal need special attention are usually routed in higher metal layers and this help reduce the effect/impact of interconnects coupling (crosstalk) on the victim interconnect (Muddu col 12 lines 58-62, also col 10 lines 37-38, Muddu discloses interconnects coupling = crosstalk).

Allowable Subject Matter

Claims 17, 32, and 47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 17, 32, and 47 would be allowable because the prior art does not teach or suggest the limitation in these claims.

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Dinh whose telephone number is 571-272-1890. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul Dinh
Patent Examiner

